DOCUMENT RESUME

ED 288 480 HE 021 008

AUTHOR Sefein, Naim A.
TITLE A Study of the Differential Achievement among Graduates of the University of Qatar, 1977-81.
PUB DATE 87
NOTE 34p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; *College Students; *Developing Nations; Foreign Countries; Grade Point Average; Grade Prediction; Higher Education; *High School Graduates; High Schools; Majors (Students); Sex Differences
IDENTIFIERS *University of Qatar

ABSTRACT

Achievement of University of Qatar graduates between 1977 and 1981 was studied. For the sample of 766 graduates, information was collected on sex, nationality, major, and year of graduation. The degree to which secondary school graduation scores can predict college achievement was examined using Pearson product moment correlation coefficients. The degree to which different programs attracted more or less capable students was examined through a multivariate analysis of variance of secondary school graduation scores. It was found that, on the average, females had higher secondary school scores than males, and non-Qataries had higher scores than Qataries. Among entering students, the superior group differed in sex and/or major from one year to another. In general, females had higher grade point averages (GPAs) than males, and students majoring in the natural sciences had higher GPAs than social science majors. Conclusions include: secondary school graduation scores moderately predict college achievement; and the differences among students at college entry did not always continue to differentiate group achievement in college. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED288480

A STUDY OF THE DIFFERENTIAL ACHIEVEMENT AMONG GRADUATES OF THE UNIVERSITY OF QATAR 1977-81

Naim A. Sefein

Professor of Educational Psychology
State University of New York
College at Fredonia, New York

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Naim A. Sefein

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

HE 021 008

BEST COPY AVAILABLE

Table of Contents

ABSTRACT

List of Tables
List of Figures

THE STUDY

I. Objectives

II. The Sample

III. Data Analysis and Findings

A. To What Extent Do Secondary School Graduation Scores Predict Achievement in College?

B. Were There Significant Differences in Ability Among Groups of Entering Students?

1. Significant Main Effects

a. Sex
b. Nationality
c. Year of graduation

2. Significant Two-Way Interactions

a. Sex x major
b. Sex x year

3. Significant Three-Way Interactions

Sex x nationality x major

4. Four-Way Interactions

C. Were There Significant Differences in College Achievement Among the Graduating Students?

1. Significant Main Effects

a. Sex
b. Major
c. Year of graduation

2. Significant Two-Way Interactions

a. Sex x nationality
b. Sex x major
c. Nationality x major

D. Were the Differences in Achievement in College Attributable to Factors Other Than the Initial Differences in Ability as Represented by the Secondary School Graduation Scores?

1. Significant Main Effects

   a. Sex
   b. Major
   c. Year of graduation

2. Significant Two-Way Interactions

   a. Sex x nationality
   b. Nationality x major
   c. Major x year of graduation

3. Significant Three-Way Interactions

   Sex x major x year

4. Four-Way Interactions

IV. Summary, Conclusions and Recommendations

A STUDY OF THE DIFFERENTIAL ACHIEVEMENT AMONG GRADUATES OF THE UNIVERSITY OF QATAR

ABSTRACT

The study attempted to answer several questions regarding achievement at the University of Qatar using the population of graduates between 1977 and 1981. The sample of graduates consisted of 766 students and was categorized along four variables: sex, nationality, major, and year of graduation.

The degree to which secondary school graduation scores can predict college achievement was examined using Pearson product moment correlation coefficient. For the group in general r was found to be .52. While this correlation is low to allow the use of these scores by themselves in individual counseling, the value of the correlation coefficient is not very different from the findings of prediction studies in other universities.

The degree to which different programs attracted more or less capable students was examined through a multivariate analysis of variance of secondary school graduation scores. Significant differences were found between males and females, Qataries and Non-Qataries and among the graduates of various years. On the average, females had higher scores than males and Non-Qataries had higher scores than Qataries. Significant interactions, however, were found between sex and major and sex and year, and sex x nationality x major indicating that among entering students the superior group differed in sex and/or major from one year to another.

The degree to which various groups of students differed in achievement in college was examined through a multivariate analysis of variance

of the grade point average scores. Significant differences were found among the group differing in sex, major and year of graduation. In general, females excelled males and majors in the natural sciences and had a higher GPA than majors in the social sciences. Non-Qataries, who as a group had a higher achievement level at high school than Qataries lost that advantage in college. Significant interactions were also observed between sex and major and between sex and year of graduation indicating a shift in the type of superior group differed in sex and/or major over the years.

Finally to answer whether the differences in achievement in college were attributable to factors other than the initial differences in ability as represented by secondary school graduation scores, an analysis of covariance was completed on the GPA scores holding the secondary school scores as constant. Significant differences remained between the groups differentiated by sex, major and year of graduation. Significant interactions were also found for sex x nationality, nationality x major and major x year indicating variables other than secondary school achievement precipitated the differential effects in college.

Explanation of the observed differences is not easy. Some reasons were suggested in the discussion. One interesting observation which cannot be easily explained is that the mean GPA at the University of Qatar dropped almost consistently over the years. More research is needed to explain that phenomenon.

List of Tables

Table 1. The Number of Graduates of the University of Qatar, Differentiated by Sex, Major, Nationality and Year of Graduation.

Table 2. Correlations Between Secondary School Scores and GPA in College for Various Categories of Graduates.

Table 3. Means of Secondary School Graduation Scores for Various Groups of Graduates.

Table 4. Multivariate Analysis of Variance of Secondary School Graduation Scores.

Table 5. Means of Grade Point Average Scores for Various Groups of Graduates.

Table 6. Multivariate Analysis of Variance of Achievement Scores in College.

Table 7. Means of Grade Point Average Scores for Various Groups After Adjusting Scores for Covariates.

Table 8. Analysis of Covariance of Achievement Scores in College.

List of Figures

Figure 1. The interaction between sex and major among secondary school achievement scores.

Figure 2. The interaction between sex and year of graduation among secondary school graduation scores.

Figure 3. Comparison between the fluctuations of mean secondary school graduation scores and GPA in college over the years 1977-81.

Figure 4. The drop in the mean GPA for males and females over the years 1977-81.

Figure 5. The interaction between sex and nationality in achievement in college.

Figure 6. The interaction between sex and major in achievement in college.

Figure 7. The interaction between nationality and major in achievement in college.

Figure 8. The interaction between sex and nationality in achievement in college (means adjusted for covariates).

Figure 9. The interaction between nationality and major in achievement in college (means adjusted for covariates).

Figure 10. The interaction between year of graduation and major in achievement in college (means adjusted for covariates).

A STUDY OF THE DIFFERENTIAL ACHIEVEMENT AMONG GRADUATES OF THE UNIVERSITY OF QATAR

I. Objectives

The study attempted to answer the following questions relative to the graduates from the University of Qatar in the years 1977-81:

1. To what degree do secondary school scores predict grades in college?
2. Were there significant differences among groups of entering students as differentiated by sex, major, or year of enrollment?
3. Were there significant differences among the graduating students in achievmeent in college, as differentiated by sex, major, nationality or year of graduation?
4. Were there achievement differences among the graduating students which might not be attributable to differences in ability as indicated by the secondary school graduation scores?

II. The Sample

All the graduates of the University of Qatar during the years 1977 to 1981 were considered for inclusion in the analysis. Complete records were found for 766 students and thus constituted the final sample.

Among the students that were eliminated from the analysis were (a) transfer students on whom high school scores were missing, (b) graduates of precollege programs other than the academic secondary schools since the scores were not available or considered not comparable, such as in the case of graduates of religious education and of the elementary teacher training institutes, and (c) graduates in home economics since it was not easy to classify them among the natural sciences vs social science dichotomy.

Table 1 shows the distribution of the sample among the various categories. The categories are based on the four sets of variables involved, namely:

a. Sex: Male (M) vs females (F)

b. Nationality: Qatari (Q) vs Non-Qatari (NQ)

c. Major: Natural and physical sciences (Sc) vs social sciences and humanities (SS)

d. Year of graduation: 1977, 1978, 1979, 1980 and 1981.

Table 1

The Number of Graduates of the University of Qatar
Differentiated by Sex, Major, Nationality and Year of Graduation

Group			Year 77	78	79	80	81	Total
SC	M	Q	5	7	3	6	3	24
		NQ	4	9	5	7	20	45
		ALL	9	16	8	13	23	69
	F	Q	9	8	15	16	26	74
		NQ	8	4	12	12	18	54
		ALL	17	12	27	28	44	128
	Q		14	15	18	22	29	98
	NQ		12	13	17	19	38	103
	ALL		26	28	35	41	67	201
SS	N	Q	27	31	17	28	38	141
		NQ	2	7	6	15	21	51
		ALL	29	38	23	43	58	192
	F	Q	47	50	40	81	53	271
		NQ	12	18	29	22	25	106
		ALL	59	68	69	103	78	377
	Q		74	81	57	109	91	412
	NQ		14	25	35	37	46	157
	ALL		88	106	93	146	137	569
Q	M		32	38	20	34	41	165
	F		56	58	55	97	79	345
	ALL		88	96	75	131	120	510
NQ	M		6	16	11	22	41	96
	F		20	22	41	34	43	160
	ALL		26	38	53	56	84	256
M	ALL		38	54	31	56	82	261
F	ALL		76	80	96	131	122	505
ALL			114	134	127	187	204	766

III. Data Analysis and Findings

A. To What Extent do Secondary School Graduation Scores Predict Achievement in College?

To answer the above question, secondary school graduation scores were correlated with the grade point averages received in college. Table 2 contains the Pearson product moment correlation coefficients for the forty groups of graduates as differentiated by sex, nationality, major and year of graduation, as well as for the combined groups. As expected, positive correlations were found between the two sets of scores in most cases. The correlations, however, varied in range from a very high coefficient of 1.00 in the case of the 1977 Non-Qataries in the social sciences to a low value of zero in the case of 1931 Qataries in the natural and physical sciences. Some correlations were negative. Caution must, however, be exerted in interpreting these correlations since sample sizes were in many cases very small and since sample homogenieties varied considerably.

To see if a better picture might emerge if the subgroups were made larger the variable year of graduation was ignored and the correlations based on the 8 subsamples in 2x2x2 cells were computed. Also the correlation between high school scores and the GPA in college was computed. These correlations are also included in Table 2. An examination of these correlations still confirms the previous observations, namely, that the degree to which high school scores predict achievement in college is limited. When the correlation based on the grand sample is merely .52 in value, individual predictions are hazardous and are not recommended.

Table 2.

Correlations Between Secondary School Scores
and GPA in College for Various Categories of Graduates.

Group			Years				
			77	78	79	80	81
Sc	M	Q	.83	.39	-.65	.63	.00
		NQ	.67	.81	-.12	-.25	.51
	F	Q	.86	.84	-.90	-.74	.71
		NQ	.63	.69	.69	.60	.82
SS	M	Q	.37	-.32	.61	.57	.29
		NQ	1.00	-.42	.61	.63	.32
	F	Q	.55	.77	.81	.59	.48
		NQ	.47	.55	.55	.43	.64

B. Were There Significant Differences Among Groups of Entering Students?

To answer this question a four-way multivariate analysis of variance was performed on the secondary school graduation scores of the graduates. The four variables were:

a) Sex: Male - Female

b) Nationality: Qatari - Non-Qatari

c) Major: Natural Sciences - Social Sciences

d) Year: 1977, 1978, 1979, 1980 and 1981

Table 3 contains the means for the 40 cells and their combinations; and Table 4 contains the results of the multivariate analysis of variance. Based on that analysis the following was observed:

1. Significant Main Effects -Significant differences existed in the main effects of sex, nationality, and year of graduation. There were no differences among the group means by major.

a. Sex - On the average, women entering the University of Qatar tended to have a higher achievement level than men.

b. Nationality - Non-Qataries tended to have a higher secondary school graduation score than Qataries.

c. Year of graduation - the average score for secondary school graduates entering the University of Qatar varied from one year to another. It was lowest in 1979. Whether this low average reflected a more difficult secondary school graduation examination in 1979 or a lower ability group of students, is a matter than cannot be indicated from the present data.

2. Significant Two-Way Interactions - An examination of the first level interaction effects indicated that there were significant interaction effects for sex x major and for sex x year combinations. The interation between sex x nationality, nationality x major, nationality x year, and major x year were nonsignificant.

Table 3

Means of Secondary School Graduation Scores
for Various Groups of Graduates

Group			Year 77	78	79	80	81	Total
SC	M	Q	57.00	58.57	49.00	59.67	55.00	56.87
		NQ	67.50	66.56	55.20	63.00	66.35	64.73
		ALL	62.25	62.56	52.10	61.34	60.68	62.00
	F	Q	67.89	71.09	70.67	76.81	73.58	72.72
		NQ	70.75	70.50	66.33	70.67	71.39	69.94
		ALL	69.24	70.83	68.74	76.18	72.68	71.54
	Q		64.00	65.20	67.06	72.14	71.66	68.83
	NQ		69.67	67.77	63.06	67.84	68.74	67.58
		ALL	66.62	66.39	65.11	70.15	70.00	66.77
SS	M	Q	66.44	59.90	61.76	60.89	63.39	62.52
		NQ	64.50	65.86	69.00	66.33	63.14	65.19
		ALL	66.31	61.00	63.65	62.79	63.13	63.23
	F	Q	65.04	68.08	67.00	71.14	67.57	68.21
		NQ	69.83	69.17	69.97	71.41	69.52	70.01
		ALL	66.02	68.37	68.25	71.19	68.19	68.71
		Q	65.55	64.95	65.44	68.51	65.82	66.26
		NQ	69.07	68.24	69.80	69.35	66.61	68.45
		ALL	66.11	65.73	67.10	68.70	66.09	66.86
Q	M		64.97	59.66	59.85	60.68	62.78	61.70
	F		65.50	68.48	68.00	72.07	69.54	69.17
		ALL	65.31	64.99	65.83	69.12	67.23	66.76
NQ	M		66.50	66.25	67.73	65.28	64.71	64.98
	F		70.20	69.41	68.90	71.15	70.30	69.99
		ALL	69.35	68.08	67.60	68.84	67.57	68.11
M		ALL	65.21	61.61	60.87	62.48	63.74	62.90
F		ALL	66.74	68.74	68.39	71.83	69.81	69.43
TOTAL			66.23	65.87	66.55	69.03	67.30	67.21

Table 4
Multivariate Analysis of Variance of Secondary School Graduation Scores.

Variable	M.S	F	P
Sex	7331.50	82.75	.0001*
Nationality	488.34	5.51	.0192*
Major	165.84	1.87	.1717
Year	240.04	2.71	.0293*
Sex x Nation	128.30	1.45	.2293
Sex x Major	893.77	10.09	.0016*
Sex x Year	310.69	3.51	.0076*
Nation x Major	78.90	.89	.3457
Nation x Year	55.38	.63	.6448
Major x Year	179.55	2.03	.0890
Sex x Nation x Major	504.74	5.70	.0173*
Sex x Nation x Year	67.08	.76	.5534
Sex x Major x Year	90.62	1.02	.3946
Nation x Major x Year	62.96	.71	.5849
4 way interaction	not significant and ignored.		

* significant values

a. Sex x major - As can be seen in Figure 1, significant differences among the mean secondary school achievement scores of males and females depended on the area of specialization. In the case of males, the social sciences group had the higher mean, while among women the natural and physical science majors had the higher mean score.

b. Sex x year - As can be seen in Figure 2, males and females differed in the mean secondary school graduation scores by year. Whether increasingly higher achievers entered the University over the years depended on whether you are examining the records of men or women. The scores of males did not consistently parallel the change in the scores of females.

3. Significant Three-Way Interactions - The interaction among the variables taken three at a time showed significant effect only in the case of sex x nationality x major. This means that in the natural sciences males did better or worse than females depending on whether the group consisted of Qataries or Non-Qataries. At times female Qataries did better than male or female Non-Qataries and at other times the trend was reversed. To put it differently, the generalization made about the superiority of women over men, or Non-Qataries over Qataries, or majors in the natural sciences over the social sciences must be moderated by the knowledge that the quality of students entering the University fluctuated between the males and females, the major area of specialization, and the years.

4. Four-Way Interactions - None of the third level interactions were significant and thus the effect was ignored.

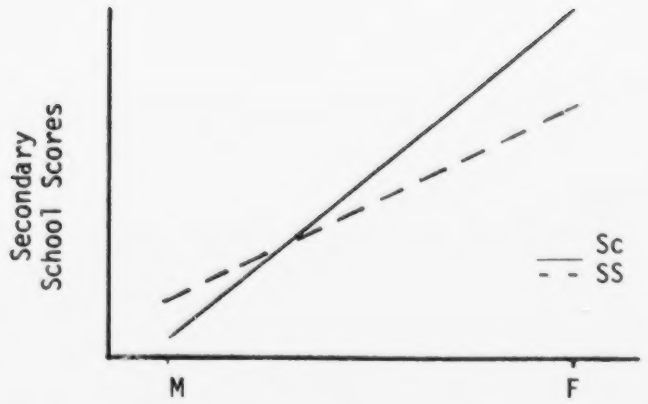

Figure 1. Interaction between sex and major among secondary school achievement scores.

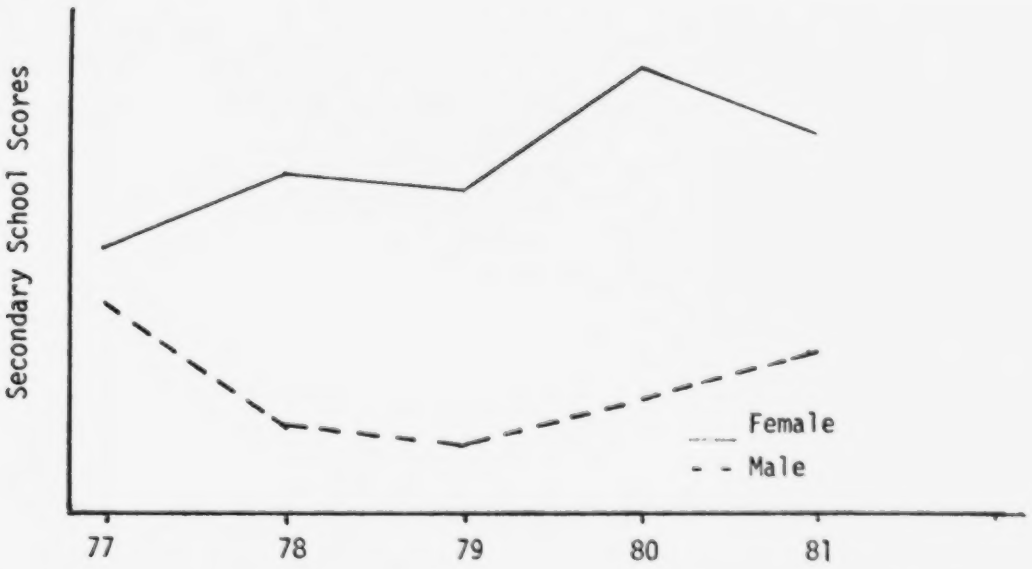

Figure 2. The interaction between sex and year of graduation among secondary school graduation scores.

C. Were There Significant Differences in College Achievement Among the Graduating Students?

To answer this question, a four-way multivariate analysis of variance was performed on the Grade Point Average (GPA) scores achieved in college. As in the previous analyses, scores were differentiated along four variables:

a) Sex: Male - Female

b) Nationality: Qataries - Non-Qataries

c) Major: Natural Sciences - Social Sciences

d) Year of Graduation: 1977, 1978, 1979, 1980 and 1981.

Table 5 contains the means for the forty cells and their combinations; and Table 6 contains the results of the multivariate analysis of variance. Based on the results of this analysis the following effects were observed:

1. Significant Main Effects - As a group Qataries did not differ from Non-Qataries in achievement in college. Considering the fact that Non-Qataries had a higher entering level of achievement, this observation is of interest. Significant differences occurred only over the main effects of sex, major and year of graduation.

a. Sex - Females did achieve higher mean GPA than males. This was probably expected since females had higher achievement average in the secondary school examination.

b. Major - Majors in the natural sciences did achieve higher mean GPA's than majors in the social sciences. This was rather unexpected since the two groups did differ in the initial stage, that is in their secondary grades. The difference is also hard to explain without further data. It may be that instruction in the natural sciences where

Table 5

Means of Grade Point Average Scores for Various Groups of Graduates

Group			Year 77	78	79	80	81	Total
SC	M	Q	3.50	3.23	2.83	2.85	3.10	3.13
		NQ	3.68	3.52	3.38	3.20	3.19	3.22
		ALL	3.58	3.39	3.18	3.04	3.18	3.25
	F	Q	3.95	4.09	3.97	4.06	3.49	3.83
		NQ	3.84	4.05	3.35	3.50	3.23	3.47
		ALL	3.90	4.08	3.70	3.82	3.39	3.68
	Q		3.79	3.68	3.78	3.73	3.45	3.66
	NQ		3.78	3.68	3.36	3.39	3.22	3.40
	ALL		3.79	3.69	3.58	3.57	3.32	3.52
SS	M	Q	3.42	3.31	2.96	2.93	2.95	3.12
		NQ	3.56	3.60	3.27	3.64	3.14	3.38
		ALL	3.43	3.36	3.04	3.18	3.02	3.19
	F	Q	3.75	3.52	3.37	3.34	3.40	3.46
		NQ	3.70	3.58	3.44	3.21	3.31	3.42
		ALL	3.74	3.54	3.40	3.32	3.37	3.45
	Q		3.66	3.48	3.38	3.32	3.27	3.40
	NQ		3.73	3.62	3.39	3.39	3.23	3.41
	ALL		3.64	3.48	3.31	3.28	3.22	3.46
Q	M		3.43	3.29	2.94	2.91	2.96	3.12
	F		3.78	3.60	3.54	3.46	3.43	3.54
	ALL		3.66	3.48	3.38	3.32	3.27	3.40
NQ	M		6.53	3.56	3.32	3.50	3.17	3.36
	F		3.73	3.62	3.39	3.39	3.23	3.41
M			3.46	3.37	3.08	3.15	3.06	3.20
F			3.78	3.62	3.48	3.42	3.38	3.51
ALL			3.67	3.52	3.38	3.34	3.25	3.40

Table 6.
Multivariate Analysis of Variance of
Achievement Scores in College.

Variable	M.S	F	P
Sex	1585.18	46.70	.0001*
Nationality	4.48	.13	.7165
Major	439.92	12.96	.0004*
Year	419.53	12.36	.0001*
Sex x Nation	512.24	15.09	.0002*
Sex x Major	364.14	10.73	.0016*
Sex x Year	12.67	.37	.8277
Nation x Major	200.42	5.90	.0154*
Nation x Year	9.39	.28	.8932
Major x Year	30.11	.89	.4711
Sex x Nation x Major	66.84	1.96	.1610
Sex x Nation x Year	36.33	1.07	.3701
Sex x Major x Year	84.93	2.50	.0412*
Nation x Major x Year	22.80	.67	.6117
4 way interaction	not significant and ignored.		

* significant values

groups were small was more individualized and thus was more effective. It could also mean that in the small classes teachers took into consideration some non-cognitive variables when they assigned the grades. More data are needed before this difference can be explained meaningfully.

c. Year of graduation - There were significant differences among the years of graduation. Since this was also true at the entry level, this difference is not unexpected. However, as seen in Figure 3, the change in achievement in college did not parallel the change in the secondary school grades over the years. The secondary school grades fluctuated up and down from their grand mean. The GPA means, on the other hand, dropped almost consistently as the years passed. This was equally true for males and for females as Figure 4 shows. What precipitated that change? The present data are not sufficient to explain. It may be a product of drop in the initial enthusiasm. As the University took its place in the society both faculty members and students dropped to a more moderate level of enthusiasm which was reflected in the grades. It may be in the early years of the University the faculty tried to heighten the motivation of students by being more generous in assigning grades. More data are needed to clarify the matter.

2. Significant Two-Way Interaction Effects - There were three significant first level interaction effects. These were the interactions of sex x nationality; sex x major; and nationality x major.

a. Sex x nationality - The difference in the achievement of males and females was tied to nationality. As can be seen in Figure 5, among men the Non-Qataries achieved a higher GPA than Qataries. The opposite trend occurred among women. Qatari women achieved higher GPA than their Non-Qatari classmates.

b. Sex x major - The interaction effect between sex and major indicates

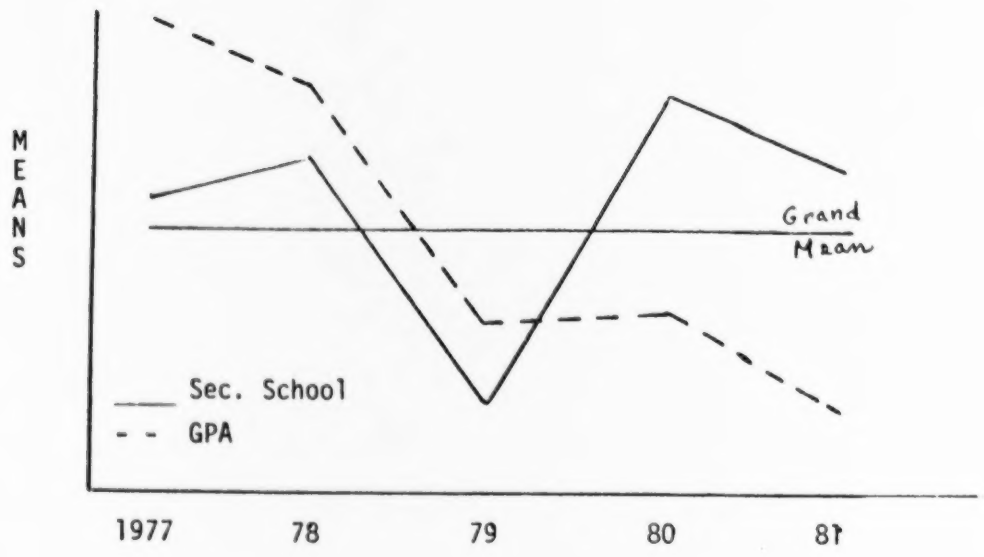

Figure 3. Comparison between the fluctuations of mean secondary school graduation scores and GPA in college over the years 1977-81.

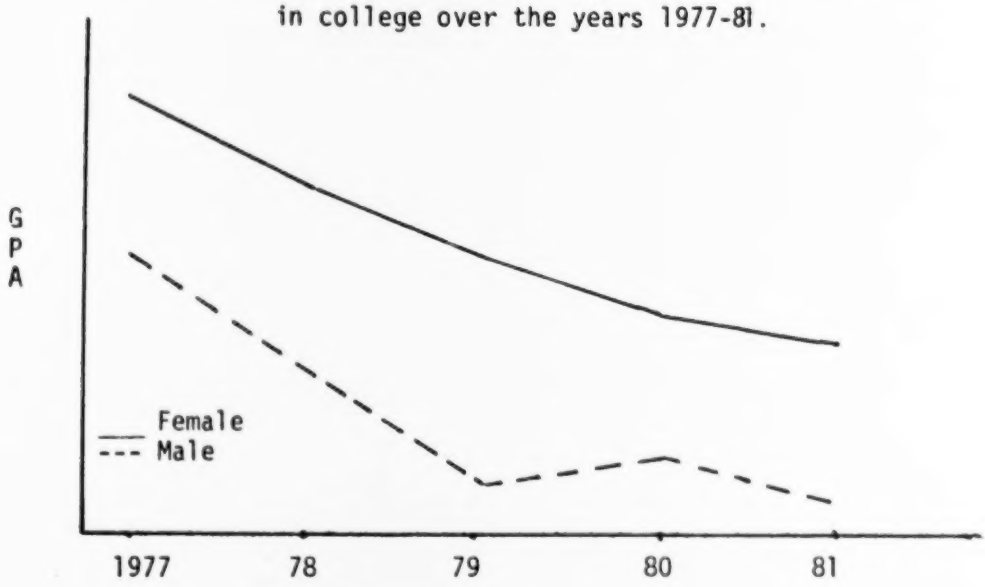

Figure 4. The drop in the mean GPA for males and females over the years 1977-81.

that whether males or females had a higher GPA depended on the area of study in which they were majoring. As can be seen in Figure 6, the interaction was precipitated by the difference in women groups. Among the women, the group in the natural and physical sciences achieved higher GPA than the group in the social sciences and humanities. Among the men, however, there was little difference between the two groups of majors in their mean GPA.

c. Nationality x major - As can be seen in Figure 7, Qataries scored higher mean grade point average in the natural sciences than Non-Qataries. In the social sciences, however, the two groups were not very different.

3. Significant Three-Way Interaction Effects - Among the four possible combinations of variables, three at a time, there was only one significant second level interaction, namely, the interaction between sex, major and nationality. In other words, males as compared with females differed in achievement depending on the major and nationality. Looking at the means in Table 5 one can see the Qatari women outperformed their Non-Qatari classmates in the natural sciences while Non-Qatari men outperformed their classmates in that area. The differences among the social sciences or among the natural and social sciences were less pronounced except in the case of Qatari women where the natural science majors outperformed their social science classmates.

4. Four-Way Interaction Effects - There were no significant third level interactions and thus they were ignored.

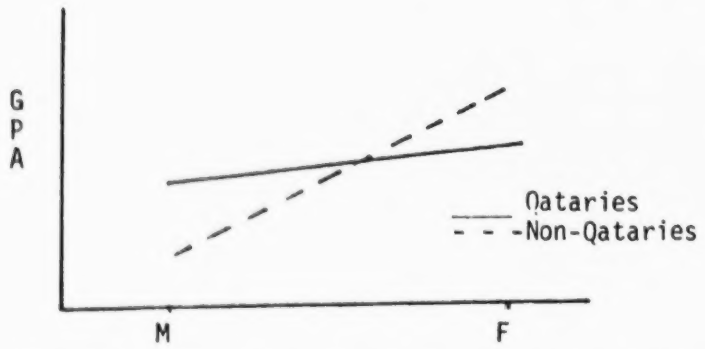

Figure 5. The interaction between sex and nationality in achievement in college.

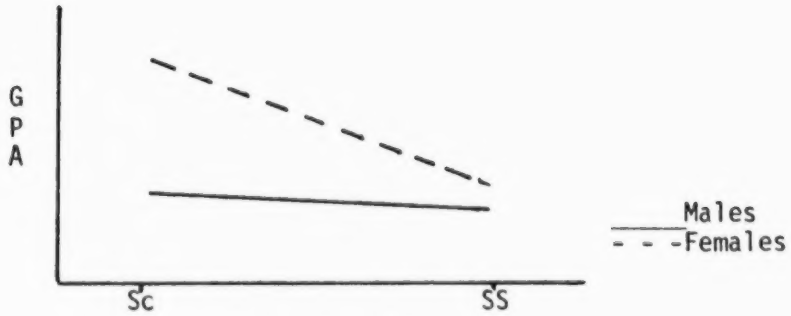

Figure 6. The interaction between sex and major in achievement in college.

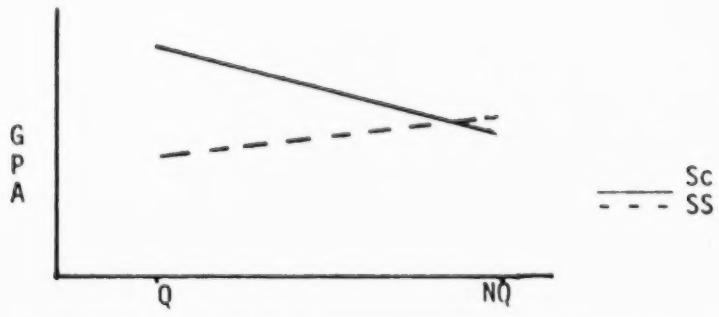

Figure 7. The interaction between nationality and major in achievement in college.

D. Were the Differences in Achievement in College Attributable to Factors Other Than the Initial Differences in Ability as Represented by the Secondary School Graduation Scores?

To answer this question a 2x2x2x5 analysis of covariance of the grade point average scores was carried, holding secondary school graduation scores as constant.

Table 7 shows the adjusted means for the forty cells and their combinations and Table 8 shows the results of the analyses of covariance. Based on the results of this analysis the following effects were observed:

1. Significant Main Effects - Three significant variables were found, namely the effect of sex, major and year of graduation. The effect of nationality was not significant. In brief, even after adjusting for initial differences in achievement the analysis shows difference among groups associated with:

a. Sex x Achievement in college differed by sex where on the average women excelled men. This may have been a by-product of the selectivity in students where some of the male high achievers in secondary schools left the State of Qatar to study subject matter disciplines not offered by the University of Qatar. It may have been due to difference in student motivation since females find an incentive in maintaining good grades as a means of receiving family approval for continued education. It may have been also a by-product of demands by the family on the time of males as compared with females since males do participate in conducting the family business. Finally, it may have been a product of interaction and the expectency effect where instructors worked harder with females whom they saw as more motivated and also gave them higher grades.

b. Major - Achievement in college differed between students in the

Table 7

Mean Grade Point Average Scores for Various Groups
After Adjusting for Covariates

Group			Year					Total
			77	78	79	80	81	
SC	M	Q	3.78	3.46	3.38	3.05	3.45	3.43
		NQ	3.62	3.50	3.72	3.29	3.18	3.46
		ALL	3.71	3.48	3.55	3.17	3.31	3.45
	F	Q	3.89	3.93	3.82	3.71	3.24	3.72
		NQ	3.68	3.90	3.34	3.35	3.07	3.47
		ALL	3.79	3.91	3.58	3.53	3.16	3.59
	Q		3.84	3.69	3.60	3.35	3.57	
	NQ		3.65	3.70	3.53	3.32	3.12	3.47
	ALL		3.70	3.56	3.34	3.23	3.59	3.52
SS	M	Q	3.40	3.50	3.10	3.09	3.03	3.22
		NQ	3.60	3.60	3.17	3.63	3.23	3.45
		ALL	3.50	3.55	3.13	3.36	3.13	3.34
	F	Q	3.78	3.45	3.34	3.18	3.35	3.42
		NQ	3.57	3.48	3.31	3.04	3.20	3.32
		ALL	3.68	3.47	3.32	3.11	3.27	3.37
	Q		3.52	3.48	3.22	3.13	3.19	3.32
	NQ		3.59	3.54	3.24	3.34	3.21	3.38
	ALL		3.59	3.51	3.23	3.24	3.20	3.35
	Q	M	3.59	3.48	3.23	3.07	3.24	3.33
		F	3.84	3.69	3.58	3.44	3.30	3.57
		ALL	3.72	3.59	3.41	3.26	3.27	3.40
NQ	M		3.61	3.55	3.45	3.46	3.20	3.46
	F		3.63	3.69	3.32	3.19	3.13	3.39
	ALL		3.62	3.62	3.39	3.33	3.17	3.43
M	ALL		3.60	3.52	3.34	3.27	3.22	3.39
F	ALL		3.73	3.69	3.45	3.32	3.21	3.48
TOTAL			3.67	3.61	3.40	3.30	3.22	3.44

Table 8.
Analysis of Covariance of Achievement Scores in College.

Variable	M.S	F	P
Sex	136.96	5.51	.0192*
Nationality	24.53	.99	.3210
Major	282.99	11.38	.0008*
Year	543.80	21.88	.0001*
Sex x Nation	360.27	14.49	.0002*
Sex x Major	88.90	3.58	.0591
Sex x Year	32.01	1.29	.2733
Nation x Major	127.72	5.14	.0238*
Nation x Year	10.35	.42	.7970
Major x Year	63.27	2.55	.0384*
Sex x Nation x Major	.93	.04	.8465
Sex x Nation x Year	30.78	1.24	.2933
Sex x Major x Year	101.24	4.07	.0029*
Nation x Major x Year	6.13	.25	.9119
4 way interaction	not significant and ignored.		

* significant values

two major areas of specialization. Majors in the natural and physical sciences did achieve higher GPA than those in the social sciences and humanities, even after adjusting for initial differences at the time they enrolled in college. This difference could be due to many reasons. A plausable one is the individualized attention majors in the natural sciences receive due to the small size of classes.

c. Year of graduation - Differences also existed in achievement from one year to another. Looking at the mean adjusted GPA for the years 1977-81 we find that they consistently decrease as time changes from the far past to the more recent. The means are 3.67, 3.60, 3.40, 3.29 and 3.22. Since this change is not explained by changes among entering freshmen one can only speculate on the reason for the consistent drop in GPA over the years.

2. Significant Two-Way Interactions - There were three significant first level interaction effects among the adjusted scores. Two of these interactions were the same as the ones which emerged in the multivariate analysis of variance. These were sex x nationality and nationalty x major. The newly emerging significant interaction was that of major x year. On the other hand, the interaction between sex and major which was significant before adjustment for initial difference, was found in the analysis of covariance as nonsignificant. Apparently the difference in the achievement of males and females is essentially one of the initial difference in preparation. The following comments intend to explain these interactions:

a. Sex x nationality: Even after correction for initial differences at the entry level neither sex nor nationality by itslef was a universal determinant of higher college achievement. As can be seen from Figure 8,

among natural science majors Non-Qataries excelled over their Qatari classmates. However, among social science majors Qataries had a higher mean GPA than their Non-Qatari classmates.

b. Nationality x major:- Neither Qataries nor Non-Qataries were universally superior to the others in achievement. The superior groups differed from one academic major to another. Qataries excelled over their Non-Qatari classmates in the natural sciences, while Non-Qataries excelled their Qatari classmates in the social sciences as shown in Figure 9. Caution, however, must be advocated here. The difference, while statistically significant is small and is unlikely to be of practical significance.

c. Major x year of graduation - As can be seen in Figure 10 majors in the natural sciences held a superiority in GPA over their classmates in the social sciences during the years 1977-80. The trend was, however, reversed in 1981 when majors in social sciences excelled their classmates in the natural sciences.

3. Significant Three-Way Interactions - There was only one significant second level interaction. This was between sex x major x year. In other words, the degree of superiority in achievement of one group over the other fluctuated from one year to another, from one major to the other as well as by the sex of the group.

4. Four-Way Interactions - There were no significant third level interaction and thus this effect was ignored in the analysis.

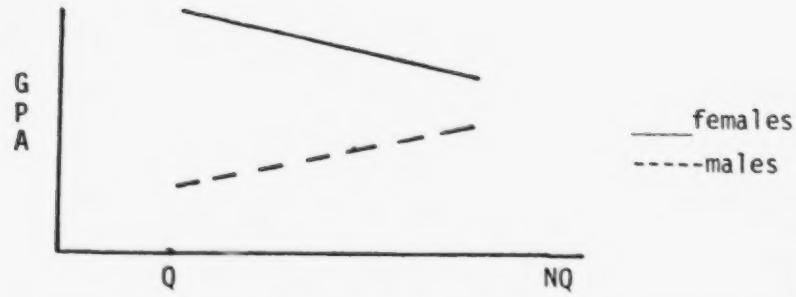

Figure 8. The interaction between sex and nationality in achievement in college (means adjusted for covariates).

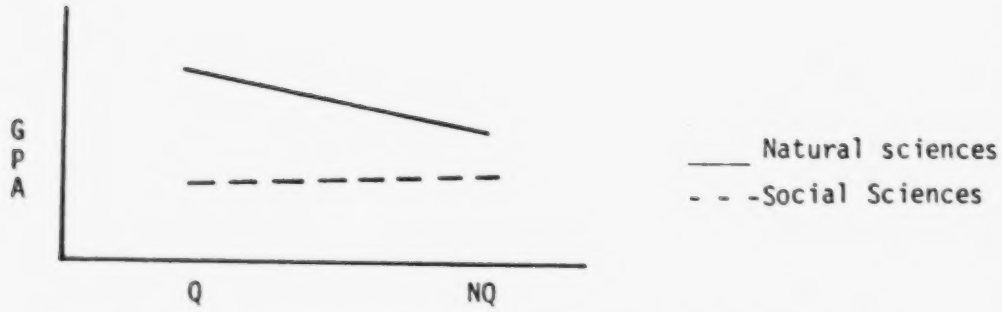

Figure 9. The interaction between nationality and major in achievement in college. (Means adjusted for covariates)

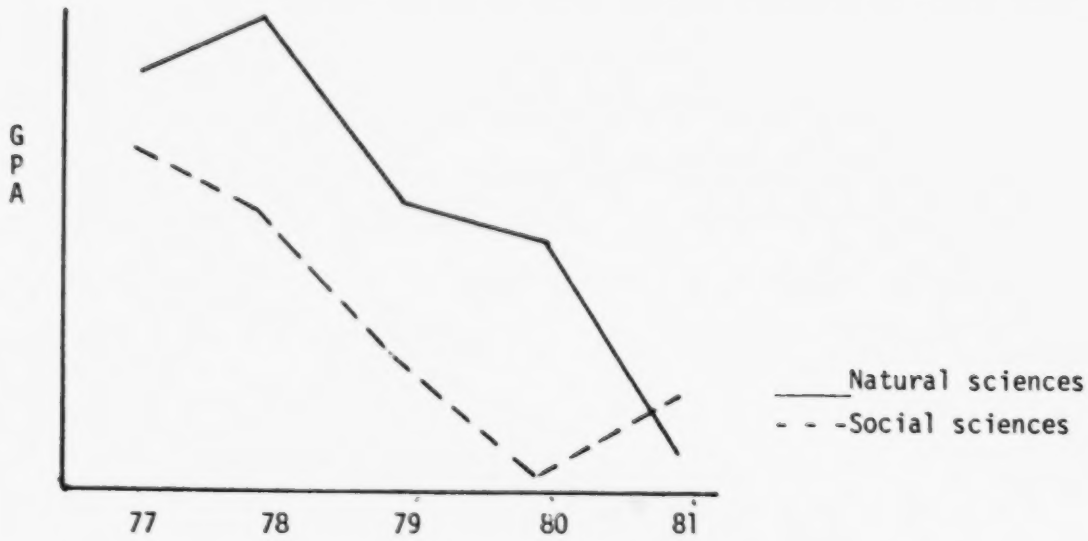

Figure 10. The interaction between year of graduation and major in achievement in college (Means adjusted for covariates).

IV. Summary, Conclusions and Recommendations

The present study of the secondary school graduation scores and achievement in college among the graduates of the University of Qatar in 1977-81 confirmed the findings on other campuses, namely, that it is hard to predict human behavior. It also raised a few questions for further considerations. The following intends to reflect on some of these issues:

1. The study found that secondary school graduation scores represented a moderate predictor of achievement in college. The fact that the correlation coefficients between the two sets of scores varied widely from one group of graduates to another and from one year to another makes the use of secondary school scores in counseling students a shaky process.

2. Assuming a stable population of students from one year to another, the study noted a wide fluctuation in the average score of the graduating students over the years which indicates that the secondary school certificate examinations have been inconsistent in difficulty from one year to another. Also, there is a good chance that the reliability of scoring these examinations differed from one year to another. True, this is a mere speculation for no data were available to this author to examine. But it would be worthwhile for the Ministry of Education to study the reliability of scoring and the possibility of developing an equation to equate the difficulty of examinations from one year to another. Naturally, it would be advantageous also to examine the validity of these examinations; the degree to which they measure the mental operations conducive to further education in the majors and the degree to which they measure fair samples of the educational objectives. Improving the assessment procedures of the

secondary school examination can improve the reliability of scores as well as their predictive power.

3. To improve counseling and prediction of success in college, the University might consider using the secondary school scores which students received in the subject matter in which they plan to major in college, i.e., using science scores to predict achievement in the sciences and the social science scores to predict achievement in the social sciences. Previous achievement in science, at the secondary school may be a better predictor of achievement in the natural sciences at the University than the combined scores on the secondary school graduation examinations. A second approach to improve prediction is through the use of multiple predictors. Both cognitive and non-cognitive variables can be used. One variable that is worth considering is the concept of achievement motive. Do students who have a high drive to succeed and who attribute success to their own initiative, God willing, do achieve better than the less motivated students?

4. The differences that existed among the students at the time they entered college did not always continue to differentiate group achievement in college. The exception was in the case of men majoring in the natural and physical sciences. Non-Qatari men did start with a higher mean achievement average in secondary education and did continue to excell their Qatari classmates in college. No such differences existed among women. Among men the area of the social sciences, Qataries did not differ from Non-Qataries either at the entry level or at graduation level. Also among women in the natural sciences, no significant differences existed among Qataries and Non-Qataries at the entry level or at the graduation level. On the other hand, among women in the social sciences, Non-Qataries who had an upper edge in secondary school achievement over the Qataries, lost that edge by the time of graduation.

The above findings indirectly document the neutrality of the academic arena toward politics. There is no evidence that the faculty at the University of Qatar favored the nationals. If they did, Non-Qatari men in the natural sciences would not have remained leading Qataries in achievement; and Qatari men in the social sciences as well as Qatari women in the natural sciences would not have continued to earn about the same grade point average in college as the Non-Qataries - much like they did in the secondary school.

5. After adjusting for differences at the starting level, students in the natural and physical sciences achieved a higher mean grade point average than those in the social sciences. No clear explanation of this difference in achievement is possible here. The two groups had about the same level of achievement in secondary schools. A possible explanation is that the small classes in the natural sciences have allowed for individualization and for higher achievement than in the social sciences. It may have also made the faculty members unable to use a quasi-normal distribution in assigning the grades among the natural science majors and skewed the curve toward higher achievement. More data are needed to clarify the matter.

6. Achievement in the University of Qatar as indicated by the mean grade point averages has dropped consistently over the years covered by the study. This pattern is equally true for men and for women, as well as for Qataries and Non-Qataries. No explanation of this trend can be given from the present data. It is unlikely that this decline means that there was a consistent drop in the quality of students over the years. It is probably a regression toward the average in the sense that with time, normalization of affairs, and the reduction of attention given to the University, faculty members have gradually adjusted their grading procedures toward the average. More data are needed to verify this hypothesis.